SYSTRON DONNER

SYSTRON DONNER CORPORATION

ADDENDUM

MODEL VP20-40S7026

The VP20-40S7026 Power Supply is similar to the VP15-85MOV as described in the enclosed manual with Special Modification S7026 added.

Special Modification S7026 consist of:

1. Input volts to 208,220,230 and 235 Vac ±10% @50/60 Hz.
2. Temperature Range: 25-50°C.
3. Output volts: 18.5-21.5V. Set to 20.0V.
4. Output Amps: 40A.
5. Overvoltage set to: 23V.
6. Overload Protection set to: 46A.
7. See Parts Lists 065147.
8. See Schematic D124170 for circuit description.

*- INDICATES DEVIATION FROM STANDARD VP15-85MOV

ITEM NO.	SIZE	PART NUMBER	DESCRIPTION	REFERENCE NO.	ASSY QTY	ACT. CODE	ISS. QTY	SHT QTY
1		065147-91	SHIPPING ASS'Y		X	X		
3	D		SCHEMATIC	D124170	1	R		
4			SPECIAL TEST	A1299		R		
6	A	PD27832	FRONT PANEL ASS'Y		1	2		
7	D	065656	" " FINISH		1	2		
8	B	06508502	METER ASS'Y 30V	M102	1	2		
9	B	0650250 1	METER MVMT 1mA 77Ω		1	1		
10		1171114	DIAL BLANK	B-065085	1	1		
11	B	065048	PC BD (METER MULTIPLIER)		1	2		
12		117124	POT. IT W.W. 5KΩ	R401	1	1		
13		102100	RES. 27.4KΩ	R402	1	1		
14		103862	HEX NUT		2	1		
15	A	06507901	METER ASS'Y 50A	M101	1	2		
16	B	0650250 1	METER MVMT 1mA 77Ω		1	1		
17		1171114	DIAL BLANK	B-065079	1	1		
18		085420	NAME-PLATE		1	1		
19		600164	POT. 1KΩ-2W	R133	1	1		
20		116650	CIRCUIT BRKR 15A	CB1	1	1		
21		770020	PILOT LAMP	DS101	1	1		
22		840220	SHAFT LOCK		1	1		
23		T920190	TIP JACK BLACK		1	1		
24		T920260	" " RED		1	1		
25		T920258	" " WHITE		1	1		
26		T920010	HANDLES		2	1		
27		106416	CAP. .1μf-600V	C113	1	1		
28			FRONT PANEL WIRING	PD28275	1	R		
29								

REVISIONS
DESCRIPTION
BY

MODEL	JOB NO.	LOT QTY	LOT NO.	CODE IDENT
				52542

PLANNER	PREP DATE	SYSTRON DONNER CORPORATION
	CHK'D	SHIPPING ASS'Y VP20-40-S7026
MAT. DUE	APP'D	
B/U REQ.		DRAWING NO.
B/U COMP		REF — SIZE P PART NO. 065147 REV

*-INDICATES DEVIATION FROM STANDARD VP15-85 MOV

ITEM NO.	SIZE	PART NUMBER	DESCRIPTION	REFERENCE NO.	ASSY QTY	ACT. CODE	ISS. QTY	SHT QTY
34	B	PD27833	MAIN CHASSIS ASS'Y		1	2		
35	D	065145	" "		1	2		
36	A	504316	TRANSFORMER	T101	1	2		
37		504085	CHOKE	L101	1	2		
38		106664	FAN	B101	1	1		
39	C	T111894	SHROUD		1	2		
40		102776	4-40 x 3/8 NYLON SCREWS		2	R		
41		T9001111	CAP. BRKT		1	1		
42	C	T109932	INSULATOR PLATE		1	2		
43		T990400	NYLON NUT		3	R		
44		840192	RUBBER FEET		4	1		
45	C	T109902	BUSS		1	2		
46	C	T109462	" (POS. OUTPUT)		1	2		
47	C	T109452	" (NEG. OUTPUT)		1	2		
48	C	T111852	" (DIODE POS)		1	2		
49	C	124322	SHUNT .0024	R134	1	2		
50		117333	P.C. BOARD SUPPORT		4	1		
51	D	T109272	CAP. CLAMP		1	2		
52		820325	CAP. 10,500µf 75V	C105, 106,	6	1		
53			S/A C105	107, 108,		R		
54			S/A C105	109, 110		R		
55		800304	1µf - 250V	C104	1	1		
56		800325	2.2µf - 250V	C103	1	1		
57		820359	17,500µf - 20V	C112	1	1		
58								
59		640530	RES. 2K Ω 5W	R135	1	1		
60		057020	BRACKET BLOWER		2	1		
64	B	PD27830	SUB-CHASSIS ASS'Y		1	2		
65	D	T109942	" "		1	2		
66	B	T100712	CAP. CLAMP		1	1		

MODEL	JOB NO.	LOT QTY	LOT NO.	CODE IDENT
				52542

PLANNER | PREP DATE | CHK'D | APP'D | MAT. DUE | B/U REQ. | B/U COMP

SYSTRON DONNER CORPORATION

SHIPPING ASSY VP20-40-S7026

DRAWING NO.

REF	SIZE	PART NO.	REV
—	P	065147	

DESCRIPTION

*-INDICATES DEVIATION FROM STANDARD VP15-85M0V

ITEM NO.	SIZE	PART NUMBER	DESCRIPTION	REFERENCE NO.	ASSY QTY	ACT. CODE	ISS. QTY	SHT QTY
			SUB-CHASSIS ASS'Y (CONT.D)		X	X		
68		820366	CAP. 20,000μf-35V	C111	1	1		
69		860055	CERAMIC STANDOFF		2	1		
70		T900003	ANGLE BRACKET		2	1		
71		T990405	NYLON NUT		4	R		
72								
73	B	T109862	BUSS EMITTER CONN.		1	2		
74								
75								
79	B	PD27827	HEATSINK ASS'Y #1		1	2		
80	D	T109912	HEATSINK		1	2		
81	C	T109882	BUSS		1	2		
82		700088	TRANSISTOR. 2N6258	Q120-Q130	8	1		
83								
84								
85								
86		830101	TRANSISTOR SOCKET		8	1		
87		630027	RES. 0.3Ω 5W 3%	R120-R130	8	1		
88								
89								
90								
91		T990405	NYLON NUT		1	R		
92			HEATSINK #1 WIRING	PD27834	1	R		
96	B	PD27828	HEATSINK ASS'Y #2		1	2		
97	D	T109912	HEATSINK		1	2		
98	C	T109882	BUSS		1	2		
99		830101	TRANSISTOR SOCKET		7	1		

MODEL	JOB NO.	LOT QTY	LOT NO.	CODE IDENT
				52542

PLANNER | PREP DATE | CHK'D | APP'D | MAT. DUE | B/U REQ. | B/U COMP

SYSTRON DONNER CORPORATION

SHIPPING ASS'Y
VP20-40-S7026

DRAWING NO.

REF	SIZE	PART NO.	REV
—	P	065147	

REV | DESCRIPTION

*- INDICATES DEVIATION FROM STANDARD VP15-85MOV

ITEM NO.	SIZE	PART NUMBER	DESCRIPTION	REFERENCE NO.	ASSY QTY	ACT. CODE	ISS. QTY	SHT QTY
37	A	PD23862	DIODE BRKT ASS'Y		1	2		
38	C	T109442	DIODE BRKT		1	2		
39		720335	DIODE, IN1184A-40HF10	CR107	1	1		
40		720047	SCR 110A-50V	CR106	1	1		
41								
42								
43	A		DIODE BRKT/SHUNT WIRING	PD27949	1	R		
47	A	PD27831	REAR CHASSIS ASS'Y		1	2		
48	B	T109472	OUTPUT INSULATOR		1	2		
49	B	081468	COVER AC		1	2		
50		850039	BARRIER STRIP		1	1		
51		851303	" "		1	1		
52		860100	HEX SPACER 1/2"		2	1		
53		069003	NAME PLATE		1	R		
54		840217	LINK		4	1		
55	A		REAR CHASSIS WIRING	PD27839	1	R		
56		069116	AC DIAL PLATE		1	2		
57		069115	" INPUT FOILCAL		1	1		
59	C	PD27825	P.C. BOARD ASS'Y		1	2		
60	D	T112256	" "		1	2		
61		100063	CAP. 10μf-25V	C12	1	1		
62		810060	35μf-25V	C5, C6	2	1		
63		102598	100μf-50V	C1	1	1		
64		810072	50μf-50V	C13	1	1		
65		821006	68μf-15V	C11	1	1		

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DESCRIPTION

MODEL	JOB NO.	LOT QTY	LOT NO.	CODE IDENT
				52542

PLANNER	PREP DATE	SYSTRON DONNER CORPORATION
	CHK'D	SHIPPING ASS'Y VP20-40-S7026
MAT. DUE	APP'D	
B/U REQ.		DRAWING NO.
B/U COMP		REF — SIZE P PART NO. 065147 REV

*-INDICATES DEVIATION FROM STANDARD VP15-85M0V

ITEM NO.	SIZE	PART NUMBER	DESCRIPTION	REFERENCE NO.	ASSY QTY	ACT. CODE	ISS. QTY	SHT QTY
			P.C. BOARD ASS'Y (CONT)		X	X		
67		100134	CAP. .05μf-200V	C7	1	1		
68								
69		800090	.01μf-600V	C3, C8 C9	3	1		
70		800002	470pf	C4	1	1		
74			DIODE, DELETED	CR5				
75		100387	IN753A	CR4	1	1		
76		100413	IN5395	CR1, 2, 6, 7,	6	1		
77			S/A CR1	12, 13		R		
78		720410	IN4741A	CR3	1	1		
79		720440	IN4148	CR11	1	1		
80		100378	IN751A	CR10	1	1		
84		025756	IC, MC 723	A1	1	1		
87		106587	TRANSISTOR, 2N2219A	Q1	1	1		
90		741001	SCR, 2N4990	CR9	1	1		
93		117188	RES. POT. 100Ω-½W	R11, 16, 21,	4	1		
94				24		R		
95		600133	POT. 500Ω	R2 R3	2	1		
96								
97		106012	2.2Ω-½W-5%	R14, 8	2	1		
98		101432	3.3K-½W-5%	R12	1	1		

REVISIONS
DESCRIPTION

MODEL	JOB NO.	LOT QTY	LOT NO.	CODE IDENT
				52542

PLANNER	PREP DATE	SYSTRON DONNER CORPORATION
	CHK'D	SHIPPING ASS'Y
MAT. DUE	APP'D	VP 20-40-S7026
B/U REQ.		DRAWING NO.
B/U COMP		REF — SIZE P PART NO. 065147 REV

*-INDICATES DEVIATION FROM STANDARD VP15-85MOV

ITEM NO.	SIZE	PART NUMBER	DESCRIPTION	REFERENCE NO.	ASSY QTY	ACT. CODE	ISS. QTY	SHT QTY
			P.C. BOARD ASS'Y (CONT)		X	X		
200		101667	RES: 220Ω - ½W	R30	1	1		
201		101454	2.2K - ½W	R32	1	1		
202		101467	1K - ½W	R23, 29	2	1		
203		101511	4.7K - ½W	R27, 31	2	1		
204		101510	6.8K - ½W	R28	1	1		
205		620402	1.96K - ½W - 1%	R7	1	1		
206		102237	1.27K - ½W - 1%	R4	1	1		
207		102199	6.19K - ½W - 1%	R5	1	1		
208		620534	4.64K - ½W - 1%	R6	1	1		
209		640360	100Ω 10W 10%	R17, 18	2	1		
210		640350	100Ω 5W 10%	R19	1	1		
211		101655	22Ω 2W	R20	1	1		
212		101459	1.5K - ½W - 5%	R22	1	1		
213		640440	470Ω 2W - 5%	R1	1	1		
214			#20 AWG JUMPER	R13	1	R		
215		630450	2.5K - 3W 3%	R15	1	1		
216		611100	2.2MEG ½W 10%	R26	1	1		
218		PD27826-01	AC-DC HARNESS		1	2		
219		PD27826	" " " LIST			R		
220		VP-1	" " " LAYOUT			R		
222		PD24413	JUMPER LIST		1	2		
223			P.C. BOARD WIRING	PD27848	1	R		
224			FAN WIRING	PD23772	1	R		
225			XFORMER WIRING	PD27837	1	R		
			CHOKE WIRING	PD27838	1	R		
227		PD23778	TOP COVER ASS'Y		1	2		
228		T115384	" "		1	2		

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DESCRIPTION

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PLANNER | PREP DATE | CHK'D | APP'D | MAT. DUE | B/U REQ. | B/U COMP

SYSTRON DONNER CORPORATION

SHIPPING ASS'Y
VP20-40-S7026

DRAWING NO.

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SYSTRON DONNER
Member THORN EMI Group

VP/VPL SERIES

INSTRUMENT DIVISION

VALUPOWER SUPPLIES

DOCUMENT NO. 120026-01

OPERATING AND SERVICE MANUAL

2727 Systron Drive • Concord, California 94518 • U.S.A.
Tel: (415) 676-5000 • TWX 910-481-9479 • Cable. SYSTRON DONNER
FSCM No. 52542

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SYSTRON DONNER
Member THORN EMI Group

TEST & MEASUREMENT GROUP OF SYSTRON DONNER WARRANTY POLICY

I Warranty

The Test & Measurement Group of Systron Donner warrants that at the time of shipment the products manufactured by Systron Donner's T & M Group and sold hereunder will be free from defects in material and workmanship and will conform to the specifications furnished by or approved in writing by Systron Donner's T & M Group.

II Warranty

A The warranty period for products published in our latest product catalog will be one year from the date of shipment. This warranty is extended only to the original buyer.

B The warranty period for products published in prior catalog, will be 90 days from the date of shipment.

C The warranty period for modified standard products, custom products, or new spare part assemblies will be 90 days from the date of shipment.

D The warranty period for systems or assemblies of miscellaneous components and products will be limited to the warranty for the stand alone component or instrument. The system itself is not guaranteed unless a specific installation and service agreement has been negotiated between Systron Donner and the customer. In this latter case, the warranty period will be 30 days after the installation of the system while the various portions of the system will be limited to the normal component or instrument stand alone warranty, and for non Systron Donner material within the system that is furnished by Systron Donner the warranty will be limited to the supplier's normal warranty.

III Warranty Adjustments

A If any defect within this warranty appears, Purchaser shall notify Seller immediately.

B Systron Donner's T & M Group agrees to repair or furnish a replacement for, but not install, any product which, within the standard warranty shall, upon test and examination by Systron Donner's T & M Group, prove defective within the above warranty period.

C No product will be accepted for return or replacement without the written authorization of Systron Donner's T & M Group. Upon such authorization and in accordance with instructions by Systron Donner's T & M Group, the product will be returned to the original manufacturing location, shipping charges prepaid by Purchaser.

IV Exclusions from Warranty

A The foregoing warranty is in lieu of and excludes all other expressed or implied warranties of merchantability or fitness or otherwise.

B Systron Donner's T & M Group will not be liable for any special or consequential damages or for loss, damages or expense directly or indirectly arising from the use of the products, or any inability to use them either separately or in combination with any other equipment or material, or from any other cause.

C The warranty does not extend to any product manufactured by Systron Donner's T & M Group which has been subjected to misuse, neglect, accident, improper installation or to use in violation of instructions furnished by Systron Donner's T & M Group.

D The warranty does not extend to or apply to any unit which has been repaired or altered at any place other than at a Systron Donner T & M Group factory, by persons not expressly approved by Systron Donner's T & M Group, not to any unit, the serial number of which has been removed or defaced or changed.

E This warranty applies to new equipment only and will cover repaired or replacement items only to the extent of the balance remaining of the items original warranty period noted above in Paragraph II.

F All freight charges will be paid for by the Purchaser.

Divisions in the Test & Measurement Group include:
Instrument Division – Concord, CA
ACD Division – Sunnyvale, CA
SD GmbH – Munich, West Germany

January 1982

SYSTRON DONNER
Member THORN EMI Group

INSTRUMENT
DIVISION

2727 Systron Drive, Concord, CA 94518
Phone (415) 676-5000
TWX 910-481-9479

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Schematic

CHAPTER 1

DESCRIPTION

1.1 INTRODUCTION

The ValuPower Series power supplies are a flexible and dependable sources of DC power, which can be used to meet a variety of needs. These needs may range in scope from inspection and production testing, to laboratory bench testing, IC and systems applications.

The voltage adjustment range makes these units well suited for specific systems applications. The ability to provide power packaged in minimum space with high reliability and performance meets the demands of most system requirements.

This instruction manual provides general characteristics and specifications, operating procedures, theory of operation, maintenance and calibration, parts lists and related schematics for the ValuPower Series power supplies.

1.2 GENERAL FEATURES

Adjustable current limiting, low noise for IC and Systems applications, slot voltage modes, current to 300 amps, positive connection cooling, automatic load short paralleling, remote sensing and programming, extremely low output impedance, overvoltage protection, UL design standards and no turn on/turn off transients are featured in the ValuPower Series power supplies. Output, Sensing, Automatic "Load Share" paralleling and Remote programming terminals are located on a barrier strip mounted on the rear panel of the unit. The AC power switch, AC pilot lamp, voltage control, and appropriate optional metering devices are all located on the front panel.

1.2.1 Constant Voltage Mode

A constant voltage is maintained across the output terminals at any preset value within the rated slot voltage range, provided that the load does not draw any more than either the rated output current or more than the preset limiting current value determined by the top recessed current control setting.

1.2.2 Automatic Foldback Current Limiting

Short circuit protection is provided by the automatic current limiting circuit which limits the maximum output current under all load conditions. The point at which automatic current limiting occurs is variable and may be selected anywhere between 40% of the rated output current and maximum rated output current of the unit. In the event of an overload, the current and voltage foldback into a safe operating region. In the event of a short circuit, the output current is limited to approximately 40% of the rated current.

1.2.3 Remote Programming

Remote programming is provided in the voltage mode of operation and may be utilized over the entire voltage range of the unit. The scale factor for remote voltage programming is approximately 500 ohms per volt.

1.2.4 Automatic "Load Share" Paralleling

Automatic "Load Share" paralleling permits interconnection of up to four supplies so that each supply is parallel and delivers an equal amount of current to the load, with single knob voltage control of all units.

Adjustable overvoltage (OV) protection is standard on all the ValuPower Series power supplies. This protection provides special circuitry to prevent the output from exceeding a preset voltage. An external adjustment control recessed in the top cover is provided to vary the point at which the OV circuit will activate. The overvoltage crowbar will latch when an overvoltage condition occurs and msut be reset by cycleing the AC input power off and on again. The OV Portection point should not be set lower than one (1) volt above the minimum power supply voltage rating or 5.5V minimum.

1.3 PRECAUTIONARY MEASURES

1.3.1 Wire Size

To assure proper regulation under all load conditions and to prevent severe distortions of the AC line voltage, it is very important to take into consideration the physical size and current handling capabilities of the input power line. Serious losses in regulation and an increase in ripple may result from underrated or overloaded AC input lines.

The maximum AC impedance from the breaker box to the power supply should not exceed 0.5 ohms.

1.3.2 Systems Considerations

In systems applications it is recommended that each power supply input power line be run separately to the AC distribution box in order to minimize cross coupling and interaction between equipment. Do not run sensitive signal leads such as the remote sensing leads in the same cable as the AC input without shielding. To keep the AC ripple in the output to a minimum, it is recommended that the AC input cables should not be run in close proximity to the output load cables.

1.3.3 Terminal Post Resistance

All terminals and shorting links serving outputs, sensing and programming must be securely tightened before use. Serious loss of regulation and an increase in ripple can result due to a voltage drop caused by loose terminals and shorting links.

The specifications cited herein for regulation and ripple can be readily attained on every power supply providing the proper method of measurement is employed. The major condiseration is that the highly stable meter and oscilloscope, specified in the calibration procedures, must be connected to the sensing terminals and not the load terminals. The reason for this precaution is that the voltage drop between the load terminals and sensing terminals will yield an inaccurate regulation ripple measure.

1.4 SPECIFICATIONS

Table 1-1 is a complete list of standard specifications for the ValuPower Series power supplies.

TABLE 1-1 SPECIFICATIONS

ELECTRICAL SPECIFICATIONS	
Input:	105-132 VAC[2], 57-65 Hz (200-250 VAC, 47-65 Hz optional available[3]) VPL units are standard 208/220 VAC single phase ±10%.
Output:	Floating; Isolated from ground 300 VDC maximum. Internal protection is provided for applied reverse voltage.

TABLE 1-1 SPECIFICATIONS (Cont'd)

ELECTRICAL SPECIFICATIONS (Cont'd)	
Regulation Line:	±0.02% or 5 mV[1], for full range line change.
Regulation Load:	0.05% of 5 mV[1], for no load to full load.
Ripple:	Less than 1 mV RMS; total ripple and noise less than 5 mV p-p or 0.05%[1] to 10 MHz.
Stability:	0.05% or 10 mV[1], for 8 hours after 30 minute warm-up. Measured at constant line, load and ambient temperature.
Temperature Coefficient (Per °C):	0.05%.
Temperature Range:	-20°C to +71°C.
Temperature Storage:	-55°C to +85°C.
Recovery Time:	50 mS to within 30 mV for a Δ 1 change as shown in the table.
Overload Protection:	Automatic Electronic Current Foldback with instantaneous automatic reset. Adjustable from 40% to 100% of rated load. (A minimum short circuit current of 10% will be delivered into any class of load, ensureing proper operation with most no non-linear loads). All models have thermostatic thermal protection.
AC Power Input Protection:	Front panel circuit breaker.
Remote Programming:	Programmable over rated voltage range. Scale factor approximately 500 ohms/volt.
Voltage Adjustment Range:	Continuously adjustable over rated voltage range. Resolution and settability 0.1%.
REmote Sett	Maintains rated regulation directly at the load. Maximum line drop 0.5V per leg is included in voltage range. Internal protection is supplied for open sensing leads.
Paralleling:	Automatic Load share paralleling with single knob control of up to four units.

TABLE 1-1 SPECIFICATIONS (Cont'd)

ELECTRICAL SPECIFICATIONS (Cont'd))	
UL Approval:	Designed to meet UL Regognized Component Index requirement.
GENERAL & PHYSICAL SPECIFICATIONS	
Design Principle:	Precision Series Pass Regulation.
Operational Modes:	Constant Voltage with Automatic Current Foldback Protections.
Controls	
Voltage:	Continuous voltage adjustment, front panel screwdriver locking adjust.
Current:	Top recessed adjustment, 40% to 100%.
Input Power:	Front panel AC ON switch and power indicator.
Current Balance:	Top recessed adjustment for auto load-share paralleling.
OV Adjust:	Top recessed adjustment potentiometer.
Metering (Option):	
Voltage:	Front Panel Voltmeter (meter accuracy ±2%).
Current:	Front Panel Ammeter (meter accuracy ±2%).
Rear Panel Power Output Terminals:	TB-3 3-8/16 heavy duty terminals for +V and -V.
Rear Panel Power Protection:	Automatic fast acting, adjustable overvoltage protection with recessed adjustment.

TABLE 1-1 SPECIFICATIONS (Cont'd)

GENERAL & PHYSICAL SPECIFICATIONS (Cont'd)	
Rear Panel Barrier Strip:	TB-1 (1) AC; (2) Ground; (3) AC. TB-2 (1) Negative Output -V; (2) Netative Sensing -S; (3) Remote Voltage Programming RVP; (4) Positive Sensing +S; (5) Positive Output +V; (6-7) Paralleling PAR; (8-12) Spares.
Universal Slide:	Integral provisions are made for rapid mounting of commonly specified centerline mounting slide assemblies (in-line screw centers). Typical slide assemblies are Emcor series 20, Grant series 4435 and Jonathan series 120 qd. To utilize slides, add snap-in mounting nuts Tinnerman type C7941-832B (8-32"). C7941-1032-3B (10-32"). When ordering specify nut size and positioning per outline drawing. No charge for factory installation.
Dimensions:	(VP) 5-1/4" x 19" (EIA) x 18-1/8" (VPL) 8-3/4 x 19" (EIA) x 22.
Weight:	(VP) 85 lbs. (VPL) 120 lbs.

NOTES:

[1] Whichever is greater.

[2] Derate output current 15% for operation above 125 VAC (or 238 VAC).

[3] Derate current 10% or temperature 10°C. Multiply ripple by 2x factor.

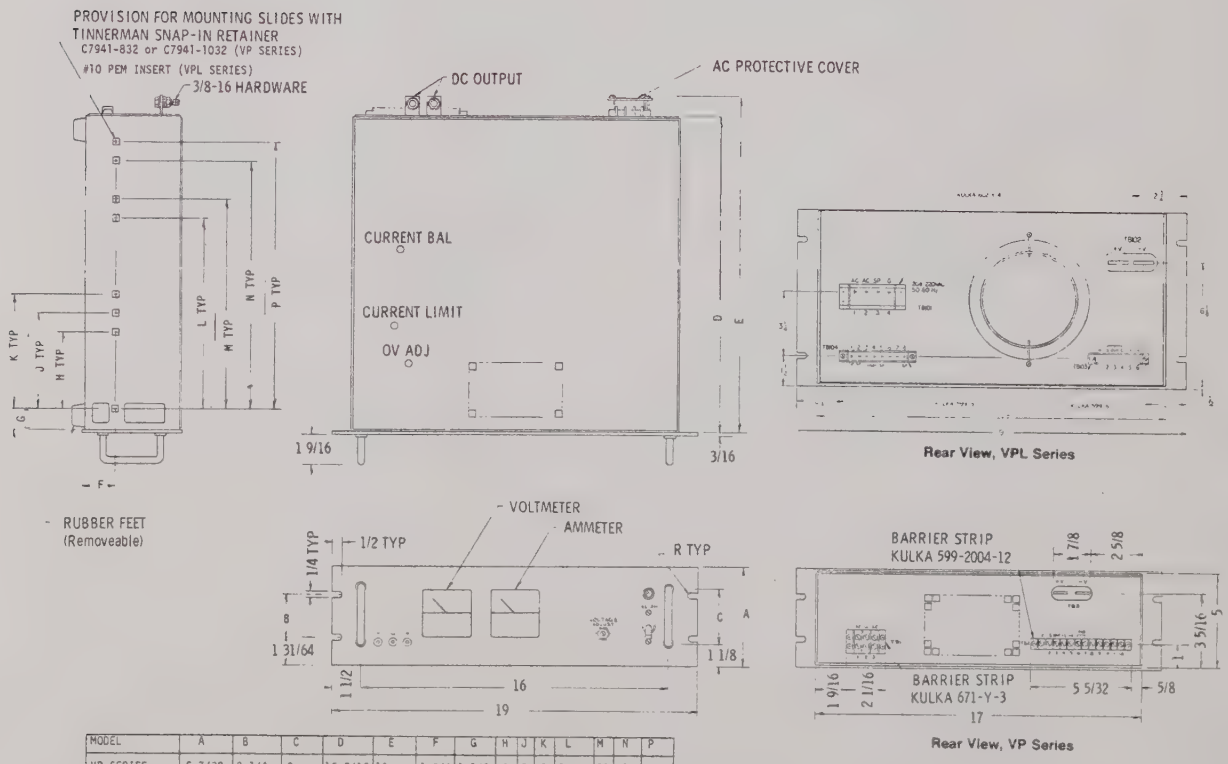
Model	Volts	Max. Amps at Ambient of: 40°C	60°C	71°C	Nominal AC Line Current ** Rms Amps	Nominal Impedance DC-1 KHz Ohms	Recovery △I Amps	Eff* (%)
VP 5-135	4.75-5.5	135	115	90	20	0.0005	40	40
VPL 5-300M	4.75-5.5	300	240	207	21	0.0005	85	40
VP 8-115	7.7-8.5	115	98	77	21	0.001	35	45
VP 12-90	11-13	90	72	58	22	0.001	30	50
VPL 12-200M	11-13	200	160	138	22	0.001	65	50
VP 15-85	14-16	85	62	49	23	0.001	25	55
VPL 15-200M	14-16	200	160	138	25	0.001	65	50
VP 24-60	23-26	60	47	38	26	0.001	20	57
VPL 24-100M	23-26	100	80	69	23	0.001	30	60
VP 28-50	26-30	50	40	31	26	0.001	15	57
VPL 28-100M	26-30	100	80	69	25	0.001	30	60
VP 48-30	46-52	30	23	19	26	0.001	10	57

For Meters add suffix M and $50. For overvoltage protection add suffix OV and $80.

Other voltages available on special order.

* Efficiency at nominal line voltage, nominal output voltage, rated load current.

**VPL Units are 208/220VAC, 1ϕ Input.



MODEL	A	B	C	D	E	F	G	H	J	K	L	M	N	P
VP SERIES	5 7/32	2 1/4	3	16 9/16	18	1 3/4	1 1/8	4	5	6	10	11	13	14
VPL SERIES	8 23/32	5 3/4	4 1/4	20 3/4	22 1/4	5 1/4	27/32	5	-	-	9 1/4	-	-	16

CHAPTER 2

INSTALLATION AND OPERATION

2.1 MECHANICAL INSTALLATION

When the ValuPower series power supply is used in a rack or bench type configuration, no special mechanical installation is required. However, integral slide mount provisions are made for rapid mounting of commonly specified centerline mounting, slide assemblies (in line screw centers).

2.2 ELECTRICAL CONNECTIONS

2.2.1 Input Power

A three-terminal for VP series and four terminal for VPL series barrier strip mounted on the rear panel provides AC input connections to the unit.

The power handling ability of the AC power lines feeding AC power to the unit must be considered, as serious losses in regulation and substantial increase in ripple may occur as a result of insufficient power capacity of these lines. All AC power line connections must be securely tightened and any movable electric contact surface (such as the wiper arm of a variable transformer) should be kept clear of impedance producing oxide coatings.

Care should be exercised in selecting the proper wire size for the AC input lines. The AC wire size should be sufficient so that the line drop does not exceed a value which will allow the input voltage to drop below the specified lower limit.

An AWG #14 should be adequate for most short runs of 20 ft. or less. Increase wire size to #12 for up to 50 feet and to #10 for up to 100 feet.

2.2.2 Rear Panel Output

Barrier strips mounted on the rear panel provide sensing, programming, automatic "Load Share" paralleling and ground connections. A heavy duty block containing two (2) stud type terminals is pro provided for output connections.

2.2.3 Front Panel Output

Three insulated tip jacks mounted on the front panel provide output and ground connections. These terminals are provided for test convenience purposes, and for easy monitoring of the output. They should not be used to draw Load Current. To achieve optimum regulation, load current must be extracted from the output block mounted on the rear panel.

2.3 OPERATING CONFIGURATIONS

The ValuPower series power supplies are designed to operate as highly regulated constant voltage sources with automatic foldback current limiting. There are various operating configurations that can be used by proper application of shorting links and wiring. The following paragraphs describe the various operating configurations and their connections.

2.3.1 Local Voltage Programming

To adjust the output voltages from the power supply, connect a shorting link across terminals -S and RVP. With this shorting link installed, the voltage adjust control provides adjustment of the output over the rated slot voltage range. (Refer to Figure 2-1 and 2-1A).

2.3.2 Remote Voltage Programming

Remote voltage programming is achieved by removing the shorting link from terminals -S and RVP and substituting a resistive element of proper value acorss terminals -S and RVP external to the power supply. (Refer to Figures 2-2 and 2-2A.)

2.3.3 Local Sensing

Local sensing connections are made when rated regulation is not required directly at a remote load.

Connect the load to output studs +V and -V and ascertain that shorting links are connected between terminals -V and -S and +S and +V. (Refer to Figures 2-1 and 2-1A.)

2.3.4 Remote Sensing

Remote sensing is used when rated regulation is required at a remote load.

Remove the shorting links between terminals -V and -S and +S and +V. Using a twisted, shielded

pair of wires, connect the -S and +S sensing terminals to the load. To prevent damage to the power supply, correct polarity of both the remote sensing and output leads must be observed. The negative remote sensing lead -S and negative output lead -V must be connected to one side of the load and the positive remote sensing lead +S and positive output lead +V connected to the other side of the load. The shield should be grounded at the power supply end of the cable.

2.4 CONTROLS

Front Panel

AC ON	Circuit breaker controls power.
Voltage Adjust	Potentiometer, adjusts voltage output.

Top Cover (Recessed Controls)

Current Limit	Potentiometer adjust current limiting point.
Current Balance	Potentiometer adjusts load sharing in parallel use.
OV Adjust	Potentiometer adjust overvoltage protection point in units having this optional feature.

2.4.1 Internal

All internal control settings have been factory preset and require no additional adjusting. However, if it should become necessary to adjust any of the internal controls due to circuit changes caused by component aging or replacement, refer to the calibration section of this manual.

2.5 OPERATION

Control Settings: Set front panel control fully CCW, top recessed controls fully CW.

Shorting Lins: Prior to the application of power, connect all loads, external wiring and shorting links required for the mode of operation desired.

Grounding: Either side of the output may be grounded, or the output may be used in a floating condition.

Power On: Connect the unit to a nominal AC input power source. Set AC power switch to on, and observe that pilot lamp is lit.

Warm Up: No warm up time is necessary to place the unit into operation. However, a 30-minute warm up period is recommended to reach rated stability. The unit is now ready for operation.

2.6 AUTOMATIC LOAD SHARE PARALLELING

2.6.1 General

To operate two or more power supplies in the automatic load share paralleling mode, select one unit as a master and the other units as slaves. Set the front panel control on the slaves fully CW and disconnect the jumper between terminals 6 and 7 on TB2, (3 and 4 on TB104). With the jumper on the master connected between terminals 6 and 7 on TB2 (3 and 4 on TB104), connect terminal 7 on TB2, (4 on TB104) on the master to terminal 7 on TB2, (4 on TB104) on all the slaves.

Use leads of approximately equal resistance for connecting load to +V terminals, or strap +V terminals directly together if near each other and use a single load from the master terminals.

Remote sensing need only be done with the master terminals. Remove jumpers from between terminals -V and -S and terminals +S and +V on master and run leads from -S to – side of lead and from +S to + side of lead. Leave jumpers in place on slave units.

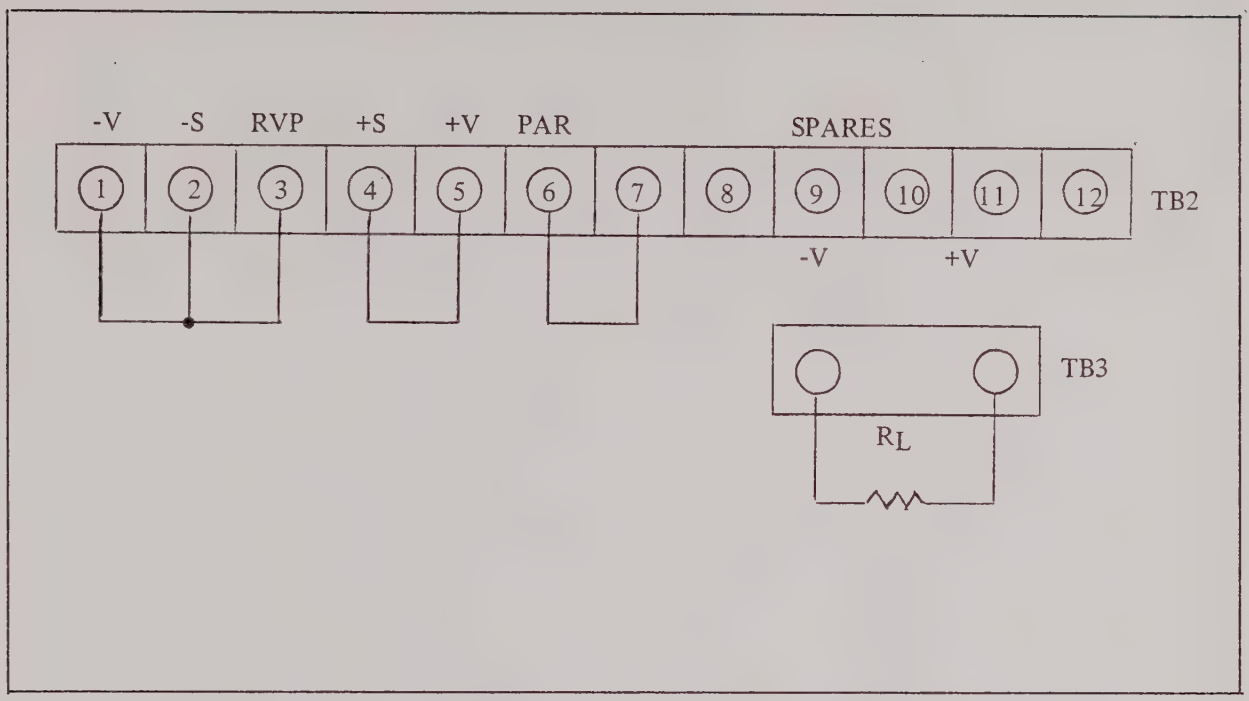


FIGURE 2-1 LOCAL PROGRAM - LOCAL SENSE VP SERIES CONNECTION

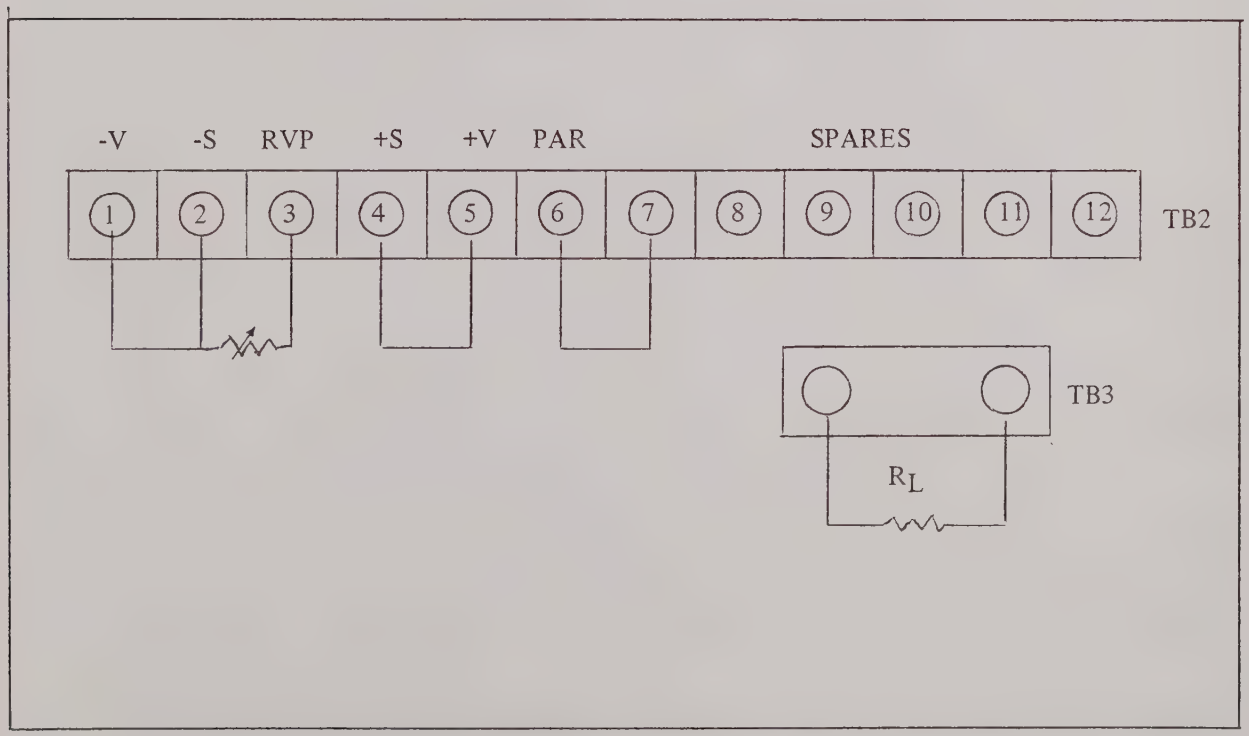


FIGURE 2-2 REMOTE PROGRAM VP SERIES CONNECTION

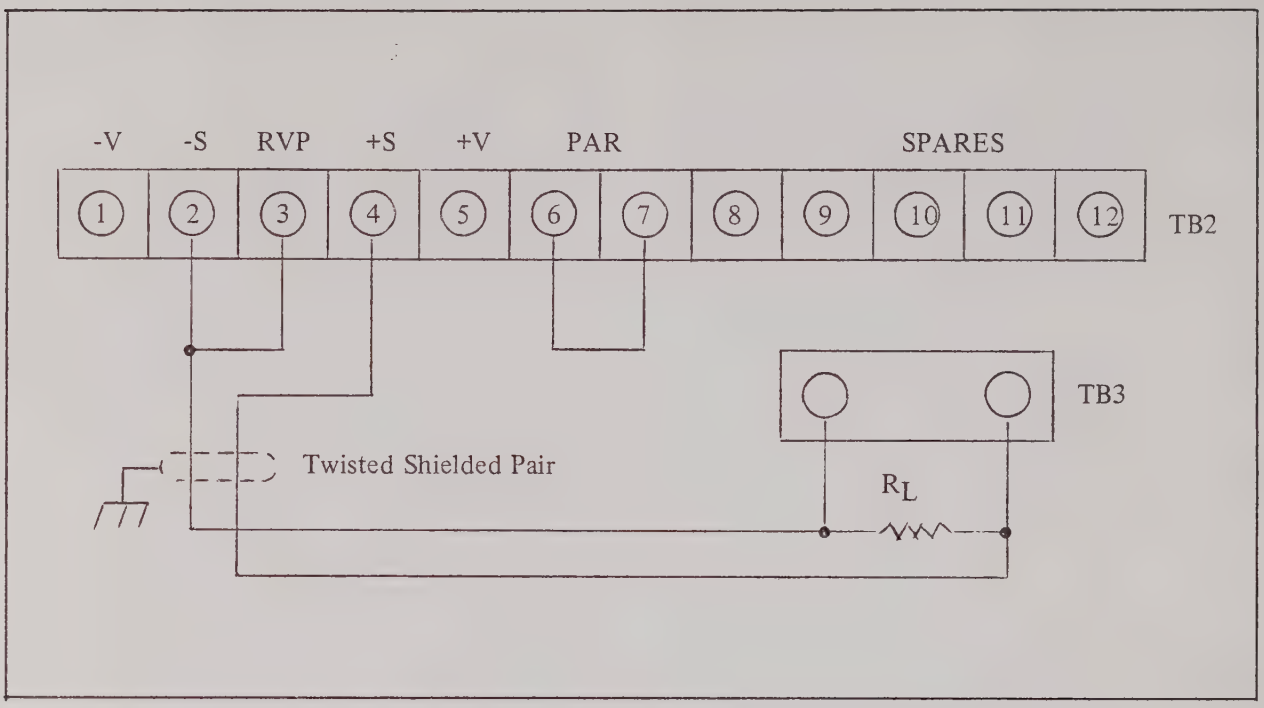


FIGURE 2-3 REMOTE SENSE VP SERIES CONNECTION

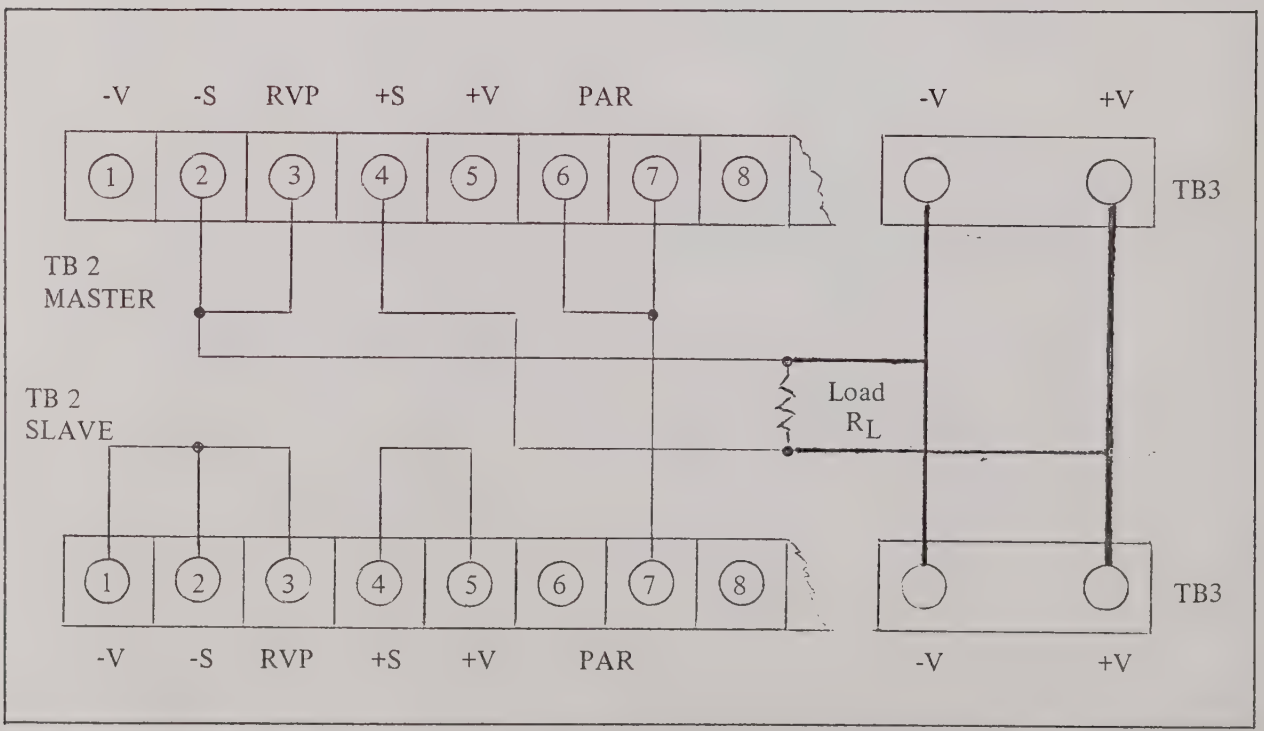


FIGURE 2-4 AUTO PARALLEL VP SERIES CONNECTION

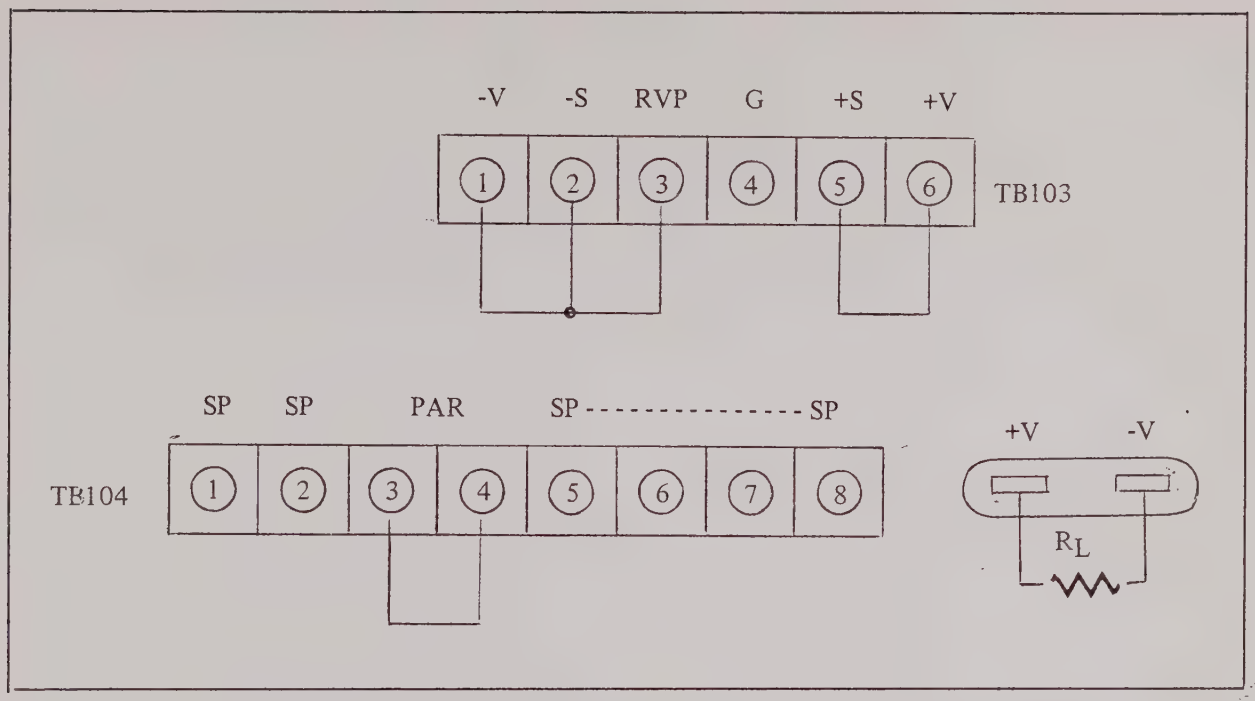


FIGURE 2-1A LOCAL PROGRAM - LOCAL SENSE VPL SERIES CONNECTIONS

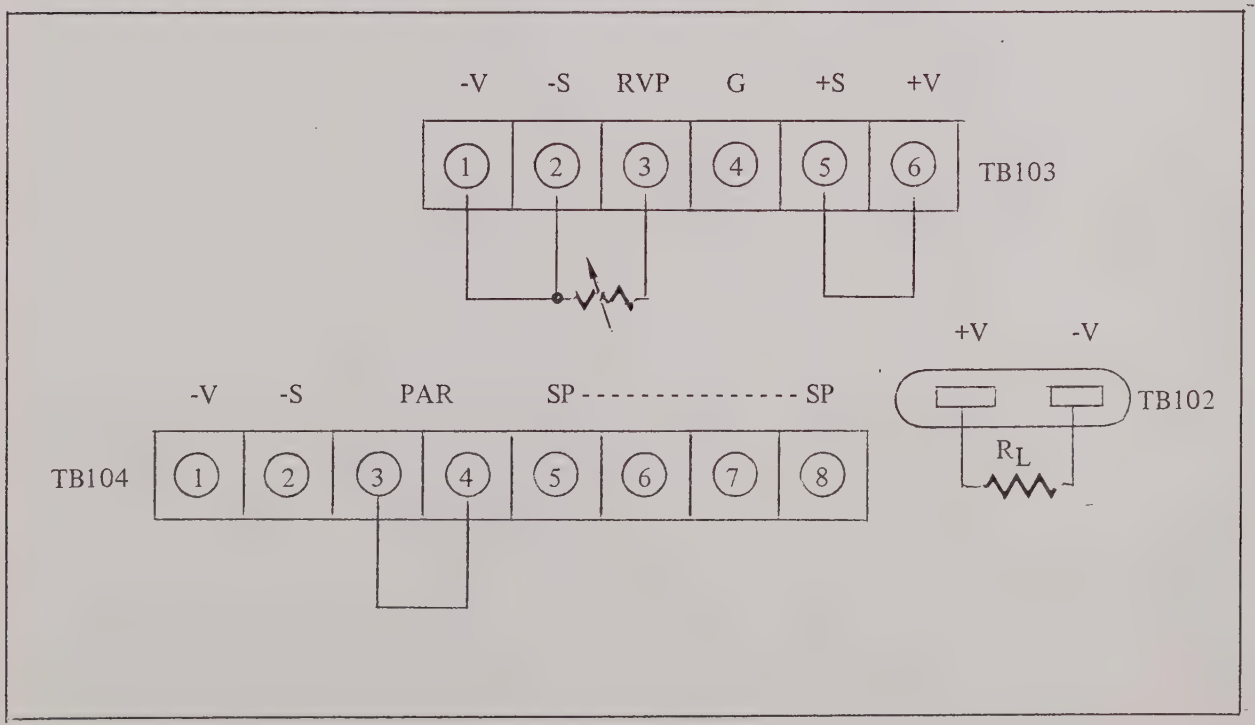


FIGURE 2-2A REMOTE PROGRAM VPL SERIES CONNECTIONS

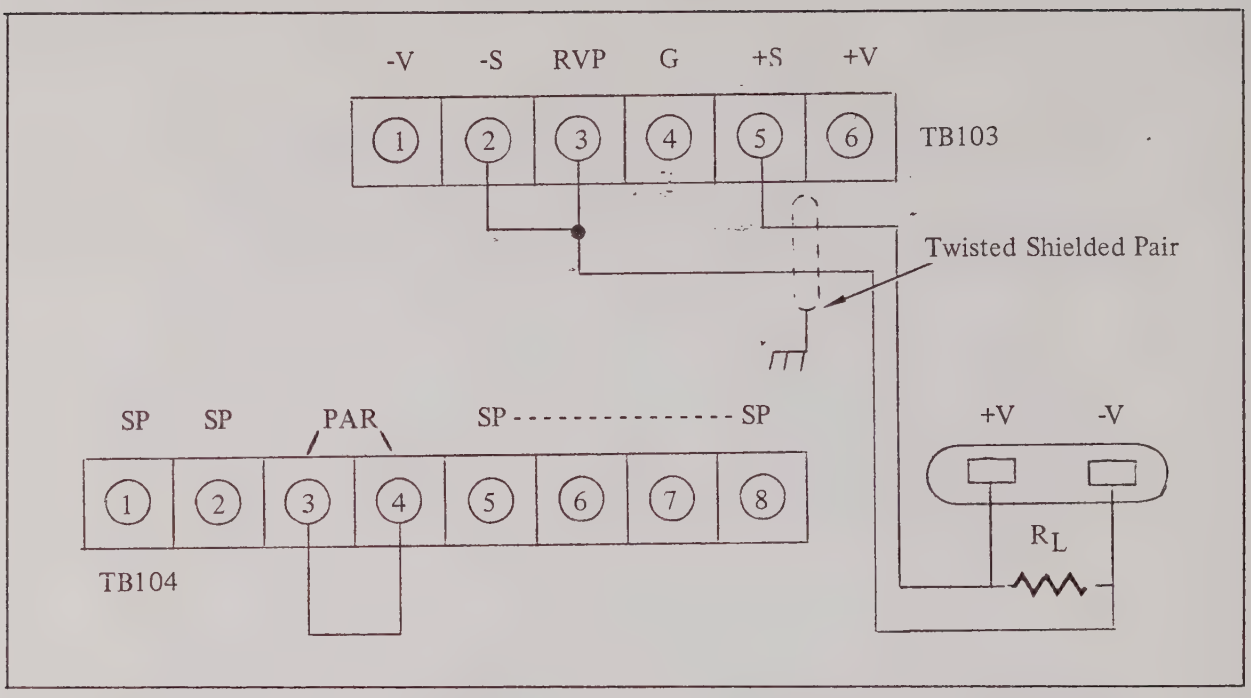


FIGURE 2-3A REMOTE SENSE VPL SERIES CONNECTION

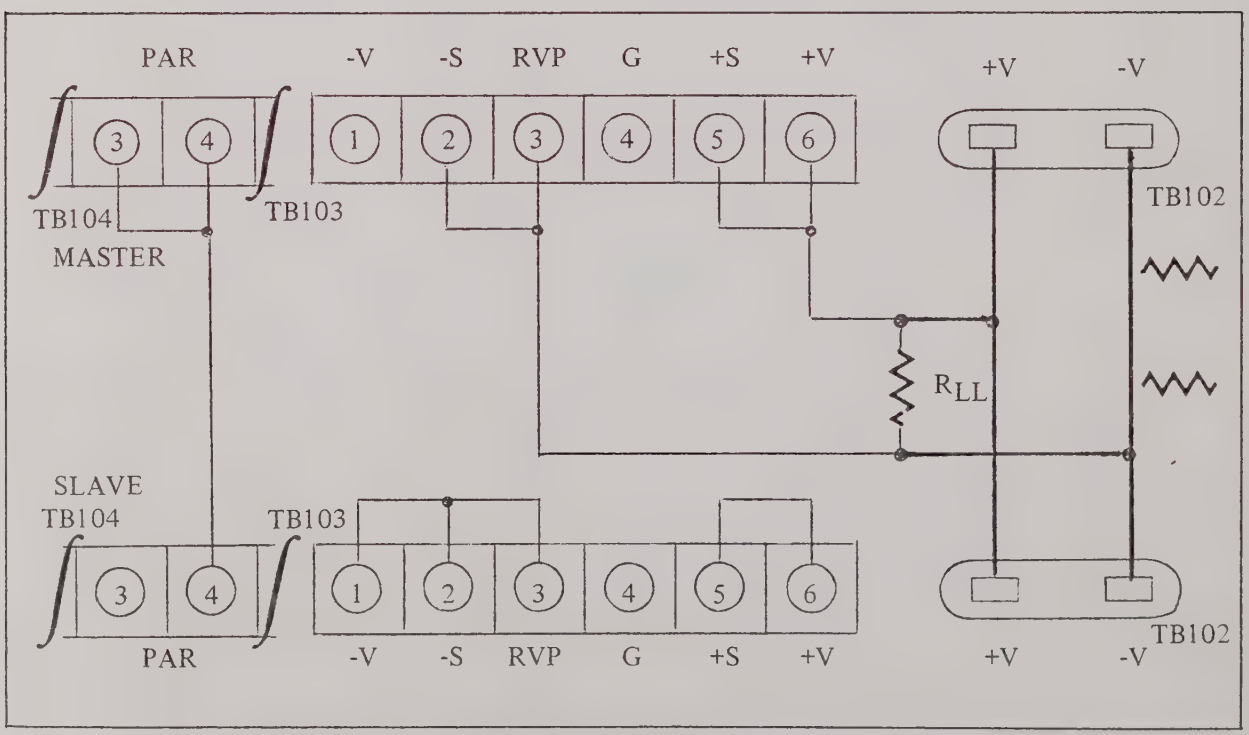


FIGURE 2-4A AUTO PARALLELING VPL SERIES CONNECTION

CHAPTER 3

THEORY OF OPERATION

3.1 GENERAL

The purpose of the ValuPower series power supplies is to transform and rectify the AC input into a well regulated, stable and adjustable DC output. The following paragraphs describe the major circuits, used in the power supply. As each circuit is described, reference should be made to both the Block Diagram, Figure 3-1 and the Schematic Diagram in the rear of this manual.

3.1.1 Primary Input

Input power is obtained through power transformers, power rectifiers, and filter capacitors. When power circuit breaker CB101 is set to ON, AC pilot lamp DS101 glows and AC power is applied to T101 and cooling fan B101. Regulated DC output voltage is immediately available from the power supply.

3.1.2 Series Regulator

The rectified voltage from CR103 and CR104 and filter capacitors C105, C106, etc., is directed through the Series Pass transistors. The conduction of these transistors is controlled by circuitry which causes them to act as variable resistors. Their overall resistance varies in accordance with the need of the power supply to increase or decrease its output voltage or current. The Series Pass transistors are controlled by driver stages which amplify signals from the Error Amplifier.

3.1.3 Reference Supply, Comparator, Error Amplifier and Current Limiting

A single integrated circuit, A1 combines the circuitry required to perform the task usually required by many discrete components.

The stable reference voltage is generated and indicated at the circuit reference V_{REF}. When A1 gets the Zener regulated voltage across its terminal 5 and 8, a precision voltage reference is developed across its terminals 4 and 5. A fixed sample of this voltage is fed into terminal 2 which is one input of the error amplifier.

The voltage which A1 compares the reference voltage to, is fed into terminal 3. Any change in the output voltage is automatically compensated for as the error amplifier generates a correction drive signal at terminal 6 which changes the output voltage accordingly.

Current limiting is provided by input 10 which will control the error amplifier's output when an overcurrent condition is present.

Terminal 9 is a compensating input to A1, to ensure stability and prevent oscillations under certain load conditions.

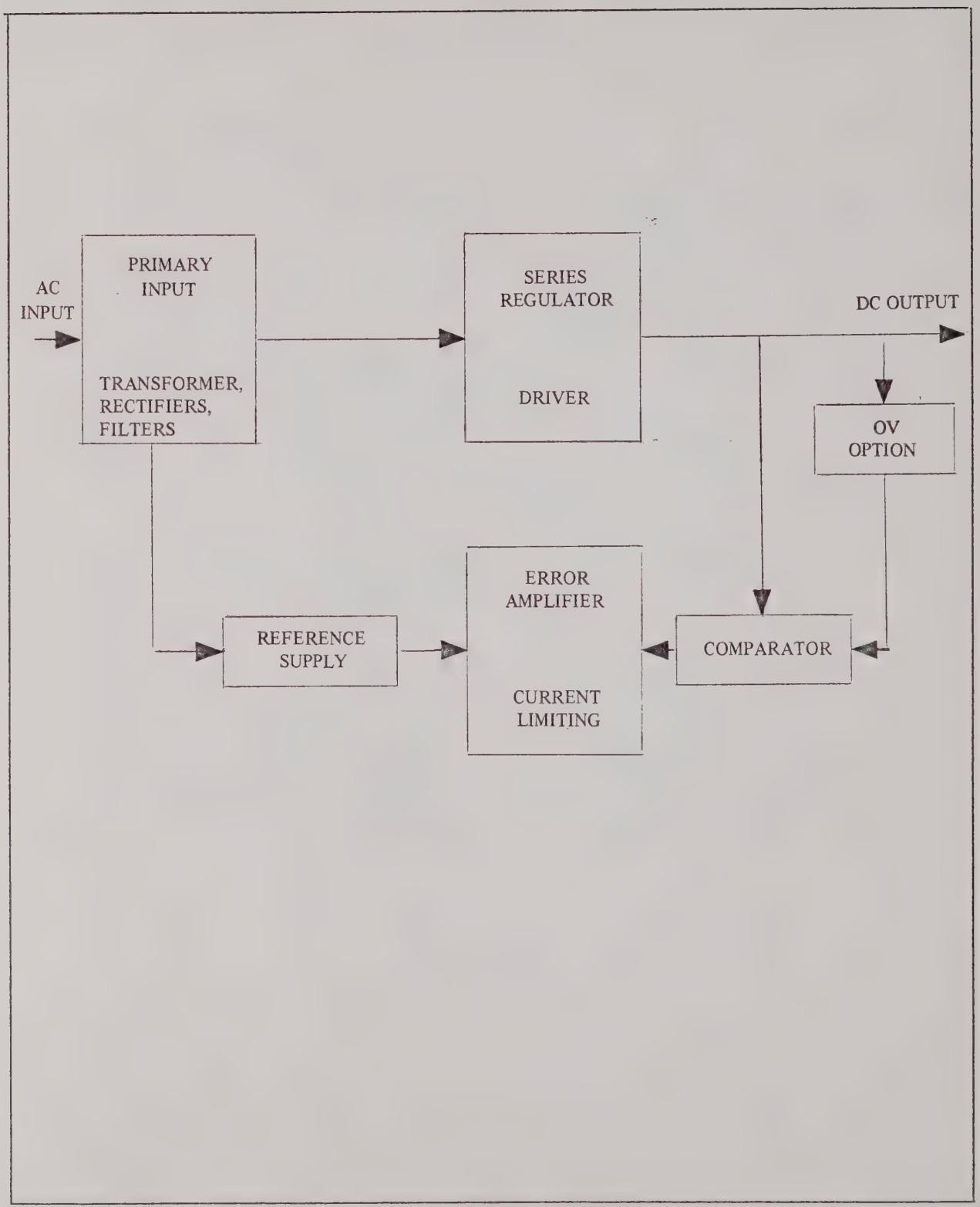


FIGURE 3-1 BLOCK DIAGRAM

CHAPTER 4

CALIBRATION AND MAINTENANCE

4.1 GENERAL

The following adjustments should be made when necessary to assure optimum operating characteristics and maximum efficiency of the ValuPower Series Power Supplies.

4.2 TEST EQUIPMENT REQUIRED (or equivalent)

1. Systron-Donner Digital Multimeter Type 9025
2. External Current Shunt (proper current rating chosen)
3. Variable Auto Transformer, 30A rating

4.2.1 Shorting Link Application

For test pruposes shorting links should be connected across rear panel barrier strip terminals -V and -S, -S and RVP, +S and +V, and PAR to provide local sensing and local voltage programming operation. To reduce pickup, shielded wire must be used for all connections between test equipment and the power supply being tested. To prevent ground loops, it is important that only one ground connection be made, as shown in Figure 4-1. Tighten all terminals as securely as possible and set the Front Panel control CW.

4.3 CALIBRATION PROCEDURE

Ammeter Calibration (not required on VPL Series)

1. Using a standard ammeter in series with an external load, adjust the load so the unit will operate at its maximum rated current (as indicated on the standard ammeter) and voltage output.

2. Adjust ammeter adjust control R24 until ammeter M101 indicates the same current as the standard meter.

Current Limit Test

1. Establish nominal output voltage.

2. Set current limit control R11 fully CW.

3. Using an external load, apply a 20% current overload to the unit under test.

4. Adjust current limit control R11 until the overload, as indicated on ammeter M1, is limited to between 5% and 10% (1.05 to 1.10 maximum rated current).

Load Regulation Test - With the equipment connected as shown in Figure 4-1, connect a suitable load resistance across the output termimal connecttions. The load resistance selected must be able to dissipate the rated power of the unit (P=IE) and must be of sufficient value to yield the rated output current when the rated voltage is applied. Note the voltage indicated on the Digital Voltmeter. Disconnect the resistive load from the output.

The maximum change in output DC voltage should not exceed by more than .05% or 5 mV (whichever is greater) that of the output voltage indicated with the load resistance applied across the output terminals.

Line Regulation Test - Place the resistive load ac across the output and note the voltage indicated on the DVM. Vary the AC input power 10% above and below the nominal AC input level. The maximum change in output voltage should not exceed by more than ±0.02% or 5 mV (whichever is greater) that of the output voltage measured at either extreme of the AC input.

Ripple Voltage Test - In order to reduce pickup, shielded test leads should be used in making ripple measurements. With the resistive load connected across the output terminals, measure the AC ripple with the AC scale of the DVM. Vary the AC input power 10% above and below the nominal AC input level. The maximum ripple amplitude should not exceed 1 mV RMS and 5 mV p-p or 0.05% (whichever is greater).

Overvoltage Sensitivity (option) - The trigger point of the OV protection circuit is determined by the setting of the OV control R21, located through the top cover. To set the OV circuit to trigger within the output range of the power supply, set R21 CW. Turn on the supply and adjust it for the desired OV firing point. Turn R21 CCW until the output voltage drops as indicated by the front panel voltmeter.

To set the OV circuit to fire at higher output voltage than the output voltage of the supply, a second current limiting type power supply is needed. With the supply under test, set its output voltage to any value. Turn R21 CW and connect the second supply across its output terminals. Set the second supply's output voltage to the desired OV firing point. Turn R21 CCW until the output of the supply drops to a low value as indicated on its voltmeter. This indicates that the OV circuit has fired at the voltage set on the second power supply.

4.4 MAINTENANCE

The power supply is a precision electronic instrument. It is strongly recommended that only experienced troubleshooting personnel perform troubleshooting operations or attempt to repair the unit. If the power supply appears to be malfunctioning at all, the following procedure is recommended for isolating possible defects.

Load and Interconnections

1. Disconnect all loads and interconnections.

2. Connect a resistive load across the output terminals and operate the unit to determine whether the fault lies within the unit or externally. Observe that shorting links are in place across terminals PAR to provide local sensing operation.

3. Set input voltage to nominal value and operating controls for rated output. Satisfactory operation at this time would indicate that any malfunction previously encountered, is external in nature. All interconnections and loads normally used in conjunction with this power supply should then be carefully checked for electrical defects.

Troubleshooting

1. Set Voltage Adjust and Voltage Vernier controls fully CW. Use a high impedance digital voltmeter to check the voltages across the various circuit components, if shown on the Schematic Diagram located at the rear of this instruction manual. Any sample voltages listed apply only if the unit is operating at its nominal AC input, and has a dummy load of sufficient size connected across its output to allow operation at maximum rated current and voltage output levles. Any reading which is grossly incorrect, indicates that the stage being tested or the one immediately preceeding it is defective. The Block Diagram, Schematic Diagram, and appropriate sections of the Theory of Operation will prove helpful in any troubleshooting work. Proper polarity to be ovserved when testing can be easily obtained from the Schematic Diagram.

2. If voltage checks show no noticeable deviations from the prescribed values, disconnect AC power and proceed with point-to-point resistance checks across potentiometers, switches, diodes, resistors and transistors in that order.

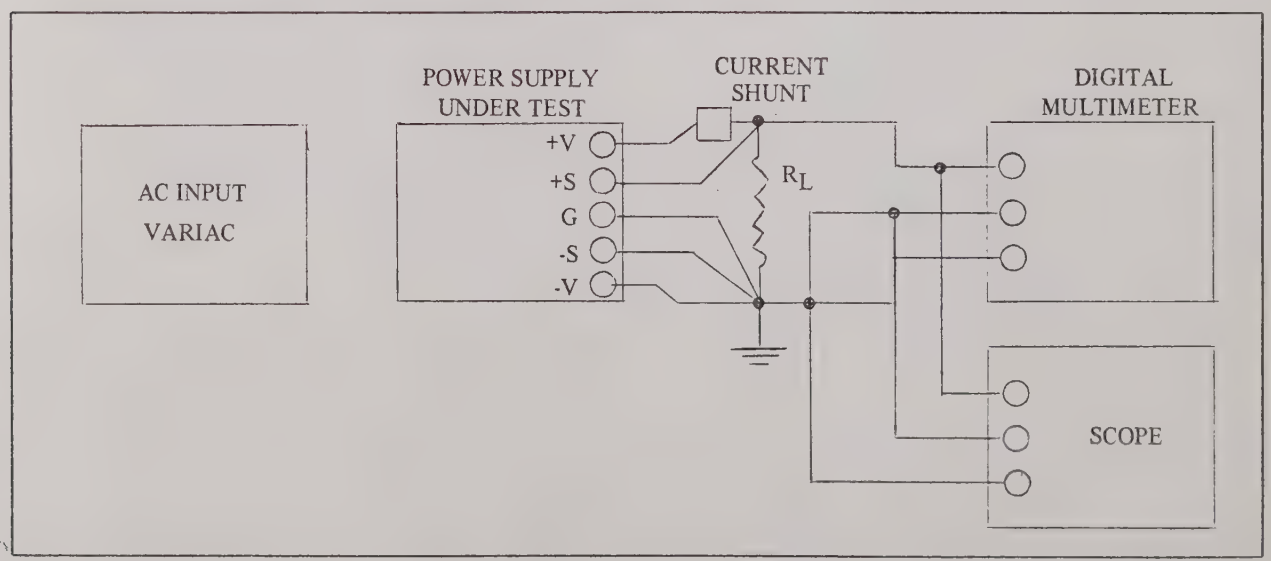


FIGURE 4-1 CONSTANT VOLTAGE OPERATION TEST EQUIPMENT SET UP

VPHD Overvoltage Protection - The overvoltage protection provided on the dual output VPHD is one whereby the total voltage of the plus and minus outputs is sensed. The overvoltage trip point is therefore approximately twice that of each individual supply. If either supply should go high in voltage it will cause the overvoltage crowbar to clamp both the plus and minus outputs to nominal zero volts.

The trigger point of the OV protection circuit is determined by the setting of the OV control R21, located through the top cover.

To set the OV circuit to trigger within the output voltage sum of the plus and minus voltages, set R21 CW. Turn on the supply and adjust the negative output voltage (the negative output is the master voltage with the positive output circuitry tracking automatically) for the desired OV firing point. Turn R21 CCW until the output voltage drops as indicated by the voltmeter.

To set the OV circuit to fire at a higher output voltage than the output voltages of the supply will adjust to, a second current limiting type power supply is needed.

Set the supply under test to its desired voltage with R21 turned CW. Connect the second supply across the plus and minus terminals of the supply under test and set its output voltage to the desired OV trip point. Turn R21 slowly CCW until the OV triggers as indicated by the drop in output voltage. This indicates that the OV circuit has fired at the voltage set on the second power supply.

CHAPTER 5

PARTS LIST

5.1 INTRODUCTION

This chapter contains the parts list for each assembly in the VP Series Power Supplies. Chapter 7 shows the assemblies where the listed parts are installed. Ordering information is included and shou should be used when purchasing parts from the factory. Expanation of thecolumn listings and Table 5-1 Manufacturer's Code-To-Name Index are also included.

5.2 PART ORDERING INFORMATION

To order a part from the Replaceable Parts Lists, state the Systron Donner part number, and indicate the quantity required and address the order to the nearest Systron Donner Sales or Service Center.

To order a part not listed in the Replaceable Parts List, state the instrument model number, instrument serial number, the description and function of the part and the number of parts required. Address the order to the nearest Systron Donner Sales or Service Center.

5.3 PARTS LIST

Each column in the parts lists provide specific information relating to the listed parts.

TABLE 5-1 MANUFACTURER'S CODE-TO-NAME INDEX

Code	Name & Address
01121	Allen-Bradley Co. . 1201 So. 2nd Street Milwaukee, WI 53204
02735	RCA Corp. - Solid State Division Route 202 Somerville, NJ 08876
03877	Transitron Electronic Corp. 168 - 186 Albion Street Wakefield, MA 01880
04713	Motorola Semiconductor Products Inc. 5005 E. McDowell Road Phoenix, AZ 85008
06540	Amatom Electronic Hardware 81 Rockdale Avenue New Rochelle, NY 10806
07263	Fairchild Camera & Instrument Corp. 313 Frontage Road Mountain View, CA 94040
14604	Elmwood Sensors Inc. 1655 Elmwood Avenue Cranston, RI 02907
15915	Tepro of Florida Inc. 2608 Enterprise Road Dunedin, FL 33528
22753	UID Electronics 4105 Pembroke Road Hollywood, FL 33021
27556	IMB Electronic Products Inc. 15401-E Carmenita Road Santa Fe Springs, CA 90670
34553	Amperex Electronic Corp. Component Division 35 Hoffman Avenue Hauppauge, NY 11787
52542	Systron Donner Corp. Instrument Division 2727 Systron Drive Concord, CA 94518
56289	Sprague Electronic Co. North Adams, MA 01247
58849	Syntron Division of FMC Corp. Homer City, PA
71590	Globe-Union Inc. Centralab Electronics Division 5757 No. Green Bay Avenue Milwaukee, WI 53201
73138	Beckman Instruments Inc. Helipot Division 2500 Harbor Blvd. Fullerton, CA 92634
75042	TRW Electronic Components Fixed Resistors Philadelphia Division 401 N. Broad Street Philadelphia, PA 19108
80294	Bourns Inc. Instrument Division 6135 Magnolia Avenue Riverside, CA 92506
81349	MIL STD
83330	Herman H. Smith Inc. 812 Snediker Avenue Brooklyn, NY 11207
91637	Dale Electronics Inc. P.O. Box 609 Columbus, NB 68601
91802	Industrial Devices Inc. 982 River Road Edgewater, NJ 07020
92702	IMC Magnetics Corp. Eastern Division 570 Main Street Westbury Long Island, NY 11591
95987	Weckesser Co. Inc. 4444 W. Irving Park Road Chicago, IL 60641

TITLE VP SERIES SHIPPING ASSEMBLY

ITEM	REF	USED ON	COMPONENT DESCRIPTION	MFR'S CODE	MANUFACTURER'S PART NUMBER	SD STOCK NUMBER	T/Q
		1	ASSEMBLY, Front Panel	52542	PD23740	PD23740	1
		2	ASSEMBLY, Front Panel	52542	PD23815	PD23815	1
		3	ASSEMBLY, Front Panel	52542	PD23480	PD23480	1
	C113	1-3	CAPACITOR, Mylar .1 μF, 600V	27556	ZA2G104K	106416	1
	CB1	1	BREAKER, Circuit 25A	81541		760110	1
	CB1	2,3	BREAKER, Circuit 50A	81541		760181	1
	DS101	1-3	LAMP, Pilot	91802	1040D32	770020	1
	M101	1	ASSEMBLY, Meter 150A	52542	06508101	06508101	1
	M101	2,3	ASSEMBLY, Meter 80A	52542	06504601	06504601	1
	M102	1	ASSEMBLY, Meter 6V	52542	06504102	06504102	1
	M102	2,3	ASSEMBLY, Meter 40V	52542	06507202	06507202	1
	R133	1	RESISTOR, Variable 500 Ω 10%,2W	81349	RA20NASD501A	600140	1
	R133	2	RESISTOR, Variable 2 k 10%,2W	81349	RA20NASD202A	600220	1
	R133	3	RESISTOR, Variable 2.5 k 10%,2W	81349	RA20NASD252A	600230	1
		1	NAME PLATE	52542	085710	085710	1
		3	NAME PLATE	52542	085750	085750	1
		1-3	LOCK, Shaft	83330	181	840220	1
		1-3	HANDLES	52542	T920010	T920010	1
		1-3	TEST JACK, Black	52542	T920190	T920190	1
		1-3	TEST JACK, Red	52542	T920260	T920260	1
		1-3	TEST JACK, White	52542	T920258	T920258	1
			MAIN CHASSIS ASSEMBLY				
		1	ASSEMBLY, Main Chassis	52542	PD23741	PD23741	1
		2	ASSEMBLY, Main Chassis	52542	PD23861	PD23861	1
		3	ASSEMBLY, Main Chassis	52542	PD23841	PD23841	1
	B101	1-3	FAN	92702	WS2107FL	106664	1
	C103	1-3	CAPACITOR, 2.2 μF, 250V	52542	800325	800325	1
	C104	1-3	CAPACITOR, El Can 1 μF, 250V	52542	800304	800304	1
	C105-10	1	CAPACITOR, El Can 42000 μF,25V	52542	820419	820419	6
	C105-10	2,3	CAPACITOR, El Can 10500 μF,75V	52542	820325	820325	6
	C112	1-3	CAPACITOR, El Can 17500 μF,20V	52542	820359	820359	1
	C114,115	2,3	CAPACITOR, El Can .22 μF,250V	52542	800252	800252	2
	L101	1	CHOKE	52542	504080	504080	1
	L101	2,3	CHOKE	52542	504085	504085	1
	R134	1	RESISTOR, Shunt .006 μF	52542	T112322	T112322	1
	R134	2,3	RESISTOR, Shunt .002 μF	52542	T109482	T109482	1
	R135	2,3	RESISTOR, CC 2 k 5%, 5W	52542	640530	640530	1
	T101	1	TRANSFORMER	52542	504079	504079	1
	T101	2	TRANSFORMER	52542	504084	504084	1
	T101	3	TRANSFORMER	52542	504086	504086	1
		1-3	SHROUD	52542	T111894	T111894	1
		1-3	SCREW, Nylon 4-40 x 3/8	95987	N-440-3/8	102776	2

Used On Code: 1 = VP5-135 MOV 2 = VP24-60 MOV 3 = VP28-50 MOV

TITLE		VP SERIES SHIPPING ASSEMBLY (Cont'd)					
ITEM	REF	USED ON	COMPONENT DESCRIPTION	MFR'S CODE	MANUFACTURER'S PART NUMBER	SD STOCK NUMBER	T/Q
		1-3	BRACKET, Cap	52542	T900111	T900111	1
		1-3	PLATE, Insulator	52542	T109932	T109932	1
		1-3	NUT, Nylon	52542	T990400	T990400	3
		1-3	FEET, Rubber	52542	840192	840192	4
		1-3	BUS	52542	T109902	T109902	1
		1-3	BUS, Positive Output	52542	T109462	T109462	1
		1-3	BUS, Negative Output	52542	T109452	T109452	1
		1-3	BUS, Diode Positive	52542	T111852	T111852	1
		1-3	SUPPORT, PC Board	52542	117333	117333	4
		1-3	CLAMP, Cap	52542	T109272	T109272	1
		1-3	BRACKET, Blower	52542	057020	057020	2
			SUB-CHASSIS ASSEMBLY				
		1	ASSEMBLY, Sub-Chassis	52542	PD23736	PD23736	1
		2	ASSEMBLY, Sub-Chassis	52542	PD23811	PD23811	1
		3	ASSEMBLY, Sub-Chassis	52542	PD23816	PD23816	1
		1-3	CHASSIS, Sub	52542	T109942	T109942	1
	C101,02	1-3	CAPACITOR, MF .1 μF,250V	52763	MKT1813-410/25	800185	2
	C111	1	CAPACITOR, El Can 35000 μF,20V	52542	820403	820403	1
	C111	2,3	CAPACITOR, El Can 20000 μF,35V	52542	820366	820366	1
	CR101,02	2,3	DIODE, Rectifier	04713	MR1120	720129	2
		1-3	CLAMP, Cap	52542	T100712	T100712	1
		1-3	STANDOFF, Ceramic	52542	860055	860055	2
		1-3	BRACKET, Angle	52542	T900003	T900003	2
		1-3	NUT, Nylon	52542	T990405	T990405	4
		1-3	CONNECTOR	52542	T109862	T109862	1
		1-3	LUG	52542	T960085	T960085	2
			HEATSINK ASSEMBLY #1				
		1	ASSEMBLY, Heatsink	52542	PD23733	PD23733	1
		2	ASSEMBLY, Heatsink	52542	PD23808	PD23808	1
		3	ASSEMBLY, Heatsink	52542	PD23833	PD23833	1
		1-3	HEATSINK	52542	T109912	T109912	1
	Q119-30	1	TRANSISTOR, Selected	52542	705076	705076	12
	Q120,21, 23,24,25, 27,28,30	2,3	TRANSISTOR, SINPN	02735	2N6258	700088	8
	R119-30	1	RESISTOR, WW .1 Ω 3%, 5W	15915	TSA5	630018	12
	R120,21, 23,-25,27 28,30	2,3	RESISTOR, WW .3 Ω 3%, 5W	15915	TSA5	630027	8
		1-3	BUS	52542	T109882	T109882	1
		1	SOCKET, Transistor	22753	PTS-2	830101	12
		2,3	SOCKET, Transistor	22753	PTS-2	830101	8
		1-3	NUT, Nylon	52542	T990405	T990405	1

Used On Code: 1 = VP5-135 MOV 2 = VP24-60 MOV 3 = VP28-50 MOV

TITLE		VP SERIES SHIPPING ASSEMBLY (Cont'd)					
ITEM	REF	USED ON	COMPONENT DESCRIPTION	MFR'S CODE	MANUFACTURER'S PART NUMBER	SD STOCK NUMBER	T/Q
			HEATSINK ASSEMBLY #2				
		1	ASSEMBLY, Heatsink	52542	PD23734	PD23734	1
		2	ASSEMBLY, Heatsink	52542	PD23809	PD23809	1
		3	ASSEMBLY, Heatsink	52542	PD23834	PD23834	1
		1-3	HEATSINK	52542	T109912	T109912	1
	C101-02	1	CAPACITOR, MF .1 μF 10%,250V	52763	MKT1813-410/25	800185	2
	CR101,02	1	DIODE, Rectifier 100V	04713	1N1200RA	725057	2
	CR109	2,3	DIODE, Rectifier 400V	04713	1N5395	100413	1
	Q108-18	1	TRANSISTOR, Selected SINPN	52542	705071	705071	11
	Q108-11, 14,16,18	2,3	TRANSISTOR, SINPN	02735	2N6258	700088	7
	R108-18	1	RESISTOR, WW .1 Ω 3%, 3W	15915	TSA5	630018	11
	R108-11, 14,16,18	2,3	RESISTOR, WW .3 Ω 3%, 5W	15915	TSA5	630027	7
	R132	1-3	RESISTOR, WW 10 Ω 10%, 2W	75042	BWH	640190	1
		1-3	BUS	52542	T109882	T109882	1
		1-3	SOCKET, Transistor	22753	PTS-2	830101	11
		1-3	NUT, Nylon	52542	T990405	T990405	1
			HEATSINK ASSEMBLY #3				
		1	ASSEMBLY, Heatsink	52542	PD23735	PD23735	1
		2	ASSEMBLY, Heatsink	52542	PD23810	PD23810	1
		3	ASSEMBLY, Heatsink	52542	PD23835	PD23835	1
		1-3	HEATSINK	52542	T109922	T109922	1
	CR103,04	1-3	DIODE, Rectifier 100V	58849	S4110+SPEC	725089	2
	CR108	1-3	DIODE, Rectifier 100V	04713	1N1184A	720335	1
	Q101,02, 04-07	1	TRANSISTOR, SINPN Selected	52542	705071	705071	6
	Q101,02, 05,07	2,3	TRANSISTOR, SINPN	02735	2N6258	700088	4
	Q103	1	TRANSISTOR, SINPN	04713	2N4912	700196	1
	Q103	2,3	TRANSISTOR, SINPN	04713	2N3738	102738	1
	R101,02 04-07	1	RESISTOR, WW .1 Ω 3%, 5%	15915	TSA5	630018	6
	R101,02	2,3	RESISTOR, WW .47 Ω 10%, 2W	75042	BWH	640069	2
	R103	1-3	RESISTOR, CC 1 k 10%, 1/2W	01121	EB1025	101467	1
	R105,07	2,3	RESISTOR, WW .3 Ω 3%, 5W	15915	TSA5	630027	2
	R131	1-3	RESISTOR, CC 100 Ω 10%, 1/2W	01121	EB1015	101498	1
	S101	1-3	SWITCH, Thermal	14604	2450-88-32	880003	1
		1	SOCKET, Transistor	22753	PTS-2	830101	6
		2,3	SOCKET, Transistor	22753	PTS-2	830101	4
		1-3	SOCKET, Transistor	22753	PTS-2	830103	1
		2	CLAMP	52542	T930187	T930187	2
		1-3	BUS	52542	T109882	T109882	1
		1-3	STANDOFF	06540	8211-8-632-3A	860070	2

Used On Code: 1 = VP5-135 MOV 2 = VP24-60 MOV 3 = VP28-50 MOV

TITLE VP SERIES SHIPPING ASSEMBLY (Cont'd)

ITEM	REF	USED ON	COMPONENT DESCRIPTION	MFR'S CODE	MANUFACTURER'S PART NUMBER	SD STOCK NUMBER	T/Q
			DIODE BRACKET ASSEMBLY				
		1	ASSEMBLY, Diode Bracket	52542	PD23860	PD23860	1
		2	ASSEMBLY, Diode Bracket	52542	PD23856	PD23856	1
		3	ASSEMBLY, Diode Bracket	52542	PD23854	PD23854	1
		1-3	BRACKET	52542	T109442	T109442	1
	CR106	1-3	DIODE, SCR	58849	70C050IL	720047	1
	CR107	1-3	DIODE, Rectifier	04713	41HF10	720335	1
			REAR CHASSIS ASSEMBLY				
		1	ASSEMBLY, Rear Chassis	52542	PD23739	PD23739	1
		2	ASSEMBLY, Rear Chassis	52542	PD23814	PD23814	1
		3	ASSEMBLY, Rear Chassis	52542	PD23839	PD23839	1
		1-3	INSULATOR, Output	52542	T109472	T109472	1
		1-3	COVER, AC	52542	081468	081468	1
		1-3	BARRIER STRIP	52542	850039	850039	1
		1-3	BARRIER STRIP	52542	851303	851303	1
		1-3	SPACER, Hex 1/2"	52542	860100	860100	2
		1-3	NAME PLATE	52542	T101040	T101040	1
		1-3	LINK	52542	840217	840217	4
			PC BOARD ASSEMBLY				
		1	ASSEMBLY, PC Board	52542	PD23730	PD23730	1
		2	ASSEMBLY, PC Board	52542	PD23805	PD23805	1
		3	ASSEMBLY, PC Board	52542	PD23830	PD23830	1
		1-3	BOARD, PC	52542	112256	112256	1
	A1	1-3	IC, Voltage Regulator	04713	MC1723	025756	1
	C1	1-3	CAPACITOR, El Ax 100 μF, 50V	34553	C437AR/H100	102598	1
	C3,8	1-3	CAPACITOR, Ceramic .01 μF,600V	71590	DD6-103	800090	2
	C4	1-3	CAPACITOR, DM 470 pF	52542	800002	800002	1
	C5,6	1-3	CAPACITOR, El Ax 35 μF, 25V	56289	40D35600250C4	810060	2
	C7	1-3	CAPACITOR, Ceramic .05 μF,200V	56289	TGS50	100134	1
	C9	1-3	CAPACITOR, Ceramic .1 μF,100V	56289	5C023104X0500C4	100178	1
	C11	1-3	CAPACITOR, Tant 68 μF, 15V	56289	196D686X0015PE4	821006	1
	C12	1-3	CAPACITOR, Tant 10 μF, 25V	56289	150D106X9020B2	100063	1
	C13	1	CAPACITOR, Tant 200 μF, 25V	52542	810161	810161	1
	C13	2,3	CAPACITOR, Tant 50 μF, 50V	52542	810072	810072	1
	CR1,2,6, 7,12,13	1-3	DIODE, Rectifier 400V	04713	1N5395	100413	6
	CR3	1-3	DIODE, Zener 11V	04713	1N4741A	720410	1
	CR4	1-3	DIODE, Zener 5.1V	03877	1N753A	100387	1
	CR5	1	DIODE, Rectifier	04713	1N747A	100469	1
	CR5,10	2,3	DIODE, Zener	03877	1N751A	100378	2
	CR8	1	DIODE, Zener	03877	1N746A	100415	1
	CR9	1-3	DIODE, SCR	04713	2N4990	741001	1

Used On Code: 1 = VP5-135 MOV 2 = VP24-60 MOV 3 = VP28-50 MOV

TITLE VP SERIES SHIPPING ASSEMBLY (Cont'd)

ITEM	REF	USED ON	COMPONENT DESCRIPTION	MFR'S CODE	MANUFACTURER'S PART NUMBER	SD STOCK NUMBER	T/Q
	CR10	1	DIODE, Zener	03877	1N751A	100378	1
	CR11	1-3	DIODE, Signal	04713	1N4148	720440	1
	Q1	1-3	TRANSISTOR, SINPN	07263	2N2219A	106587	1
	R1	1	RESISTOR, WW 200 Ω 5%, 5W	75042	BWH	640389	1
	R1	2,3	RESISTOR, WW 470 Ω 10%, 2W	75042	BWH	640440	1
	R2	1-3	RESISTOR, Variable 500 Ω, 1/2W	73138	72PR500	600133	1
	R3	1-3	RESISTOR, Variable 2 k 10%,1/2W	80294	3380P1203	600207	1
	R4	1-3	RESISTOR, MF 2.26 k 1%, 1/2W	81349	RN65D2261F	620436	1
	R5	1	RESISTOR, MF 3.4 k 1%, 1/2W	81349	RN65D3401F	620488	1
	R5	2	RESISTOR, MF 12.4 k 1%, 1/2W	91637	MFF 1/4 T1	102201	1
	R5	3	RESISTOR, MF 13.7 k 1%, 1/2W	81349	RN65D1372F	620634	1
	R6	1-3	RESISTOR, MF 4.64 k 1%, 1/2W	81349	RN65D4641F	620534	1
	R7	1-3	RESISTOR, MF 1.96 k 1%, 1/2W	81349	RN65D1961F	620402	1
	R8,14	1-3	RESISTOR, CC 2.2 Ω 5%, 1/2W	01121	EB2205	106012	2
	R11,16, 21,24	1-3	RESISTOR, Variable 100 Ω, 1/2W	73138	72PR100	117188	4
	R12	1	RESISTOR, CC 680 Ω 5%, 1/2W	01121	EB6815	101475	1
	R12,32	2	RESISTOR, CC 2.2 k 5%, 1/2W	01121	EB2225	101454	2
	R12,13	3	RESISTOR, CC 3.3 k 5%, 1/2W	01121	EB3325	101432	2
	R13	2	RESISTOR, CC 150 Ω 5%, 1/2W	01121	EB1515	101527	1
	R13	3	RESISTOR, CC 1.2 k 5%, 1/2W	01121	EB1225	101455	1
	R15	1	RESISTOR, WW 400 Ω 5%, 5W	75042	BWH	640434	1
	R15	2,3	RESISTOR, WW 2.5 k 3%, 3W	15915	TS3 2.5k 3%	630450	1
	R17,18	1	RESISTOR, WW 7.5 Ω 10%, 10W	75042	BWH	640182	2
	R17,18	2,3	RESISTOR, WW 250 Ω 10%, 10W	75042	BWH	640400	2
	R19	1	RESISTOR, WW 20 Ω 5%, 5W	75042	BWH	640250	1
	R19	2,3	RESISTOR, WW 200 Ω 5%, 5W	75042	BWH	640389	1
	R20	1	RESISTOR, WW 3.3 Ω 5%, 2W	75042	BWH	640140	1
	R20	2,3	RESISTOR, WW 47 Ω 10%, 2W	75042	IRC	640280	1
	R22	1-3	RESISTOR, CC 1.5 k 5%, 1/2W	01121	EB1525	101459	1
	R23,24	1-3	RESISTOR, CC 1 k 5%, 1/2W	01121	EB1025	101467	2
	R26	1	RESISTOR, CC 2.2 M 10%, 1/2W	01121	EB2251	611100	1
	R27,31	1-3	RESISTOR, CC 4.7 k 5%, 1/2W	01121	EB4725	101511	2
	R28	1-3	RESISTOR, CC 6.8 k 5%, 1/2W	01121	EB6825	101510	1
	R30	1-3	RESISTOR, CC 220 Ω 5%, 1/2W	01121	EB2215	101667	1
	R32	1,3	RESISTOR, CC 2.2 k 5%, 1/2W	01121	EB2225	101454	1

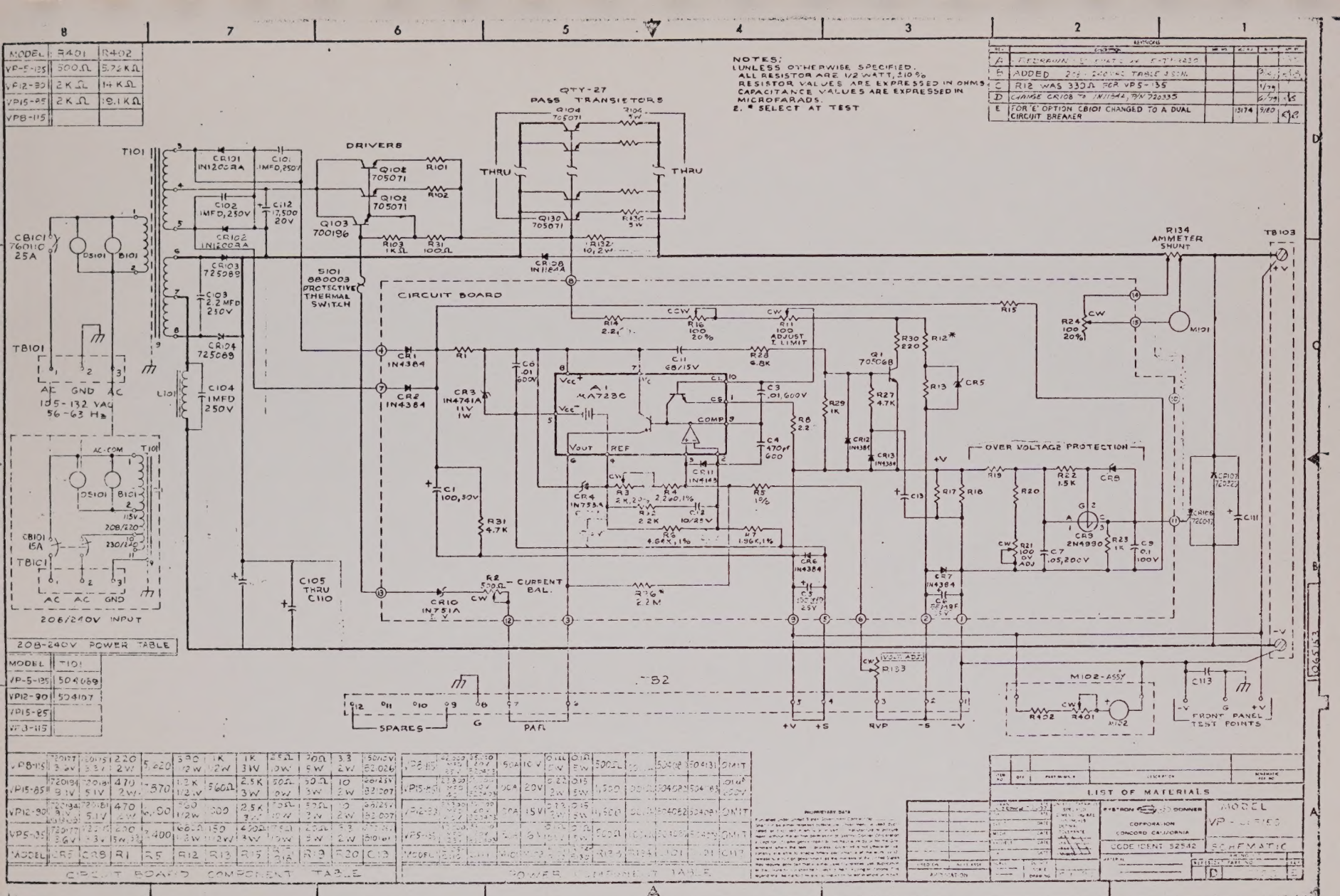
Used On Code: 1 = VP5-135 MOV 2 = VP24-60 MOV 3 = VP28-50 MOV

CHAPTER 6

DRAWINGS

6.1 INTRODUCTION

This chapter contains the schematic drawings for the VP Series ValuPower Supplies. These diagrams relate to the circuit details described throughout this manual. The parts lists contained in Chapter 5 relate to the reference designation and item call-outs on the diagrams.



MODEL	R401	R402
VP-5-135	500Ω	5.72KΩ
VP12-90	2KΩ	1+KΩ
VP15-85	2KΩ	9.1KΩ
VP8-115		

NO.	REVISIONS	BY	DATE	APP'D
A	REDRAWN & UPDATED PER E-ECN-1232			
B	ADDED 208-240VAC INPUT TABLE & SCH.			8/79
C	R12 WAS 330Ω FOR VP5-135			1/79
D	CHANGE CR108 TO IN1184A, P/N 720335			6/79
E	FOR 'E' OPTION CBIOI CHANGED TO A DUAL CIRCUIT BREAKER		13174	9/80

208-240V POWER TABLE

MODEL	T101
VP-5-135	504089
VP12-90	504107
VP15-85	
VP3-115	

MODEL	CR5	CR8	R1	R5	R12	R13	R15	R17	R18	R19	R20	C13
VP8-115	5.1V 3W	5.1V 2W	220 2W	5.62Ω	330 12W	1K 2W	1K 3W	25Ω 10W	20Ω 5W	3.3 2W	50/15V 82.026	
VP15-85	720184 9.1V	720184 5.1V	470 2W	570	1.2K 1/2W	560Ω	2.5K 3W	50Ω 5W	50Ω 3W	10 2W	60/25V 82.007	
VP12-90	720184 9.1V	720184 5.1V	470 2W	400	500 1/2W	500	2.5K 3W	50Ω 5W	50Ω 3W	10 2W	60/25V 82.037	
VP5-135	720177 5.6V	720177 5.6V	220 2W	2400	680 1.5W	150 1.5W	470Ω 3W	25Ω 10W	25Ω 5W	3.3 2W	50/15V 810-001	
MODEL	CR5	CR8	R1	R5	R12	R13	R15	R17	R18	R19	R20	C13

CIRCUIT BOARD COMPONENT TABLE

MODEL	T101	L101	M101	R131	R132	R133	R134	R401	R402	C111	C112	C113
VP8-115	504088	504131	0.1MA 500Ω		50Ω 5W	500Ω	0.02Ω 100W	50Ω 5W	5.72K 1/2W	50/15V 82.026	17,500 20V	.01MF 600V
VP15-85	504089	504129	0.1MA 500Ω		50Ω 5W	500Ω	0.02Ω 100W	50Ω 5W	9.1K 1/2W	50/15V 82.026	17,500 20V	.01MF 600V
VP12-90	504107	504128	0.1MA 500Ω		50Ω 5W	500Ω	0.02Ω 100W	50Ω 5W	1+K 1/2W	50/15V 82.026	17,500 20V	.01MF 600V
VP5-135	504089	504131	0.1MA 500Ω		50Ω 5W	500Ω	0.02Ω 100W	50Ω 5W	5.72K 1/2W	50/15V 82.026	17,500 20V	.01MF 600V
MODEL	T101	L101	M101	R131	R132	R133	R134	R401	R402	C111	C112	C113

POWER COMPONENT TABLE

QTY	PART NUMBER	DESCRIPTION	SCHEMATIC REF. NO.

LIST OF MATERIALS

		MODEL VP-SERIES
	CONCORD CALIFORNIA	SCHEMATIC
	CODE IDENT 52542	
		SIZE D